# THE LIFE HISTORY OF THE WESTERN AUSTRALIAN SKIPPER *MESODINA CYANOPHRACTA* LOWER (LEPIDOPTERA: HESPERIIDAE)

Andrew A.E. Williams[1] and Andrew F. Atkins[2]

[1]*Department of Conservation and Land Management, W.A. Wildlife Research Centre, P.O. Box 51, Wanneroo, W.A. 6065*
[2]*Design Department, The University of Newcastle, Callaghan, N.S.W. 2308*

## Abstract
The life history of *Mesodina cyanophracta* Lower is described and illustrated. The early stages of *M. cyanophracta* and *M. halyzia* (Hewitson) are compared.

## Introduction
*Mesodina cyanophracta* Lower (Figs 7, 8) was recognised only recently as distinct from *M. halyzia* (Hewitson) (Edwards 1987). *M. cyanophracta* is restricted to south-western Australia where it occurs from 36 km west of Binnu near Geraldton, south to Albany and inland to the Stirling Range; adults have been taken from late October to March (Common and Waterhouse 1981, Dunn and Dunn 1991). We have recent records from Condingup Peak, 65km east of Esperance (33°45'41"S 122°32'53"E), and from Mount Ragged in Cape Arid National Park (33°28'02"S 123°27'31"E). Around Perth the peak flying time is in November and the foodplant is *Patersonia occidentalis* R.Br. (Iridaceae) (Williams *et al.* 1993). The larval and pupal stages of *M. cyanophracta* have not been described in detail, although Common and Waterhouse (1981) and Edwards (1987) stated that the early stages are similar to *M. halyzia.*

## Life history
*Egg* (Figs 1, 9, 10). Diam. 1.75 mm, hemispherical, off white changing to pale green with maroon dorsal blotch, acentric to micropyle. Surface covered with a delicate lace-like ribbed structure.

*First instar larva* (Fig. 2). Length 3.5-4.0 mm. Head shiny black, surface faintly pitted and covered with variable pale setae; prothoracic plate shiny black; collar between head and prothoracic plate bright orange-red. Body tapered, yellowish, last segment pinkish; covered with variable white setae, some slightly clubbed; posterior setae long and slender.

*Mature larva* (Fig. 3). Length 20-26 mm. Head (Fig. 4) large and rounded, greyish black in colour, surface granulated and covered with variable pale setae. Body greyish-brown with short clubbed setae, posterior with long whitish setae. A narrow blackish dorsal line extends almost the length of the body. Medium-sized to mature larvae are covered with a white waxy powder which tends to obscure the skin coloration.

*Pupa* (Fig. 6). Length 18-22 mm, broad anterior tapering to posterior with small cremaster. Frons (Fig. 5) more or less smooth with small elliptical operculum pointed laterally. Colour somewhat variable; fresh pupae with

thorax and wing cases dull green, abdomen cream to yellow cream and frons grey-brown. As development progresses the pupae darken and some individuals turn almost black.

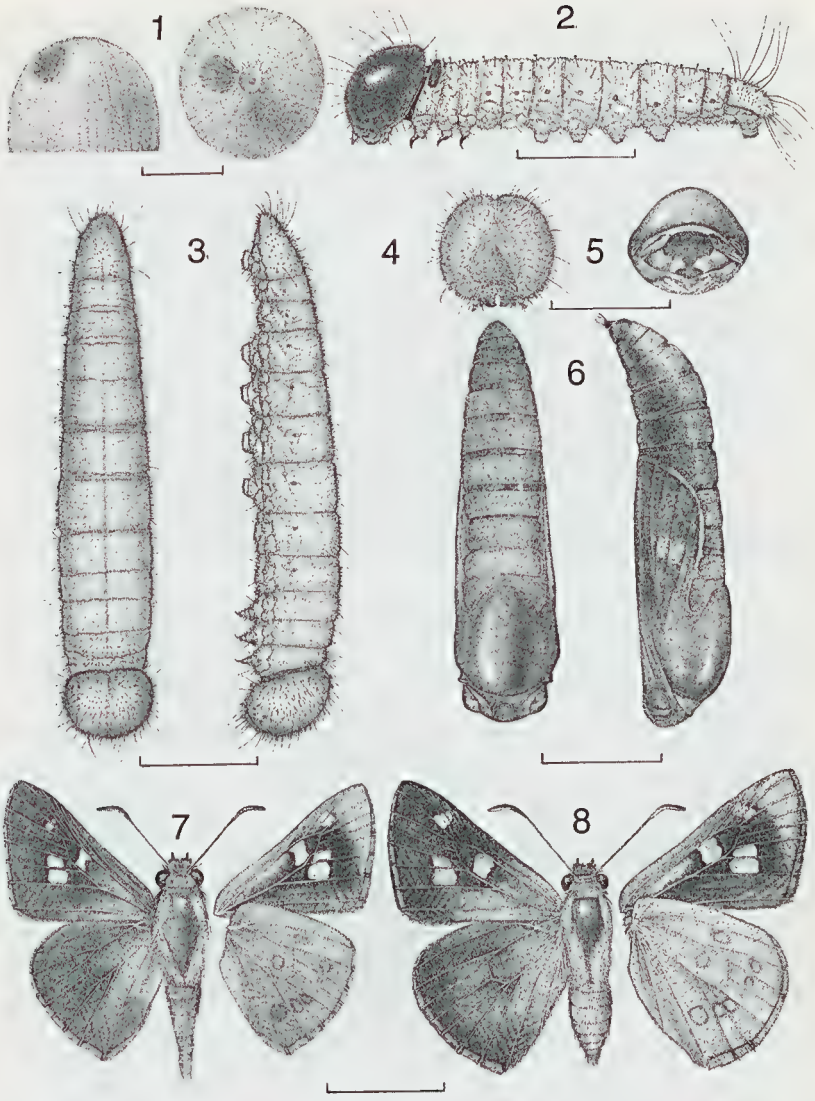
**Observations and Discussion**

Eggs were found at Moore River National Park, 100 km north of Perth, in mid November 1993 and transferred to *P. occidentalis* plants suitably located for observation near Wanneroo. Larvae hatched after several days and consumed their egg casings before constructing shelters. Most individuals made shelters by drawing together the outer edges of a single leaf of the foodplant to form a partial tube, which was then sealed at the top. Others sewed together the extreme tips of two leaves to form a shelter. Early stage larvae invariably fed on the upper edges of the leaves in close proximity to their shelters.

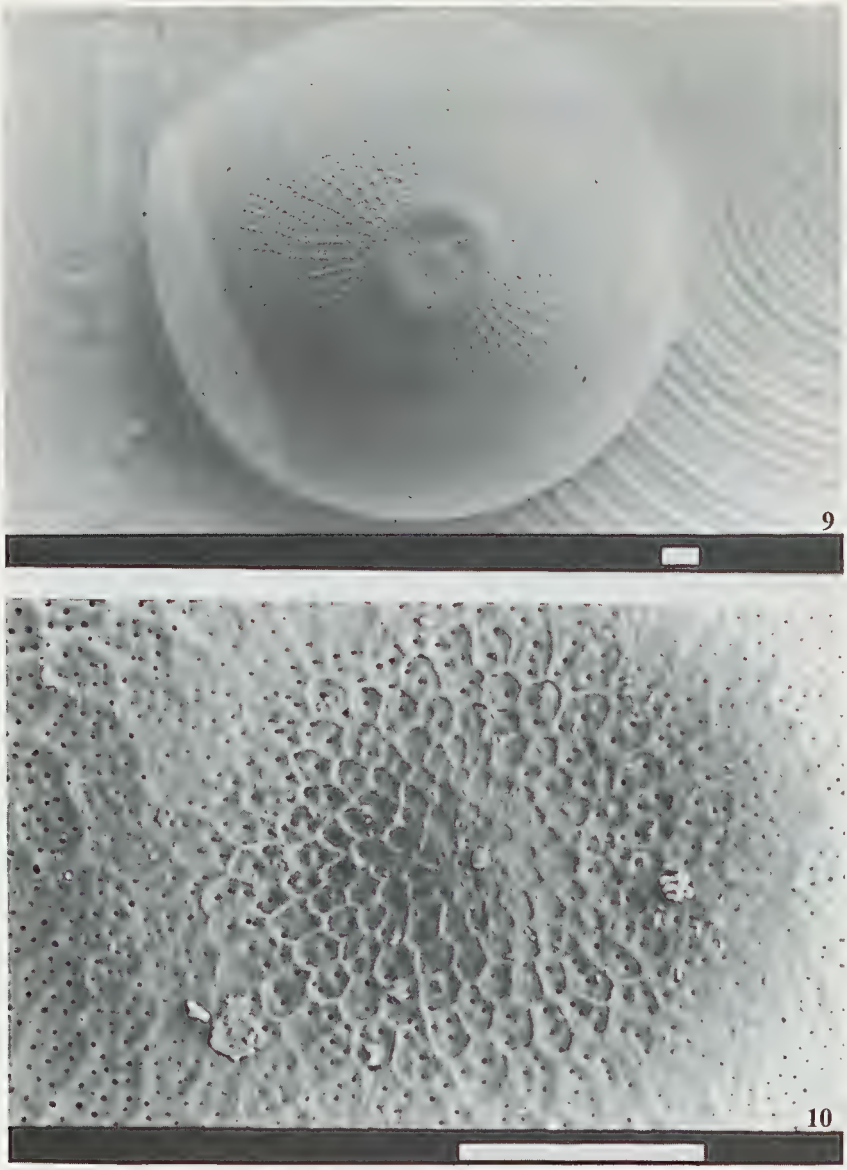
As larvae increased in size they abandoned their first shelters and constructed larger ones by sewing together three or four leaves of the foodplant to form a tent-like structure. These shelters were closed at the top and lined with silk with the entrance underneath. Larvae rested head downwards within the shelters and fed during the day, as do larvae of *M. halyzia* (Common and Waterhouse 1981). They produced distinctive feeding scars by cutting wedge-shaped sections out of the leaves; in some cases this resulted in leaves taking on a saw-toothed appearance. Larvae fed actively in November, December and again from May to October. They remained largely inactive during the hot dry summer months. Larvae pupated head downwards within their shelters. Before pupating they sealed the entrance with a horizontal pad of silk. Pupal duration was approximately 35 days.

Differences were found between the pupae of *M. cyanophracta* and *M. halyzia*. The most distinctive feature of *M. cyanophracta* is the comparatively small elliptical pupal cap (operculum), which is pointed laterally, unlike that of *M. halyzia* which is broadly elliptical, rounded laterally and with a more roughened sclerotized area on the upper frons. Mature larvae of *M. cyanophracta* also differ in colour from those of *M. halyzia* which are pale greenish in colour (Common and Waterhouse 1981). Scanning electron micrographs of the eggs of *M. cyanophracta* and *M. halyzia* (Figs 9-12) show subtle differences in their delicate lace-like ribbing. In *M. cyanophracta* the cross ribs are more prominent and the micropyle pattern more diffuse and complex than in *M. halyzia*. The delicate ribbed structure of *Mesodina* eggs is unique in the Trapezitinae (AFA pers. obs.).

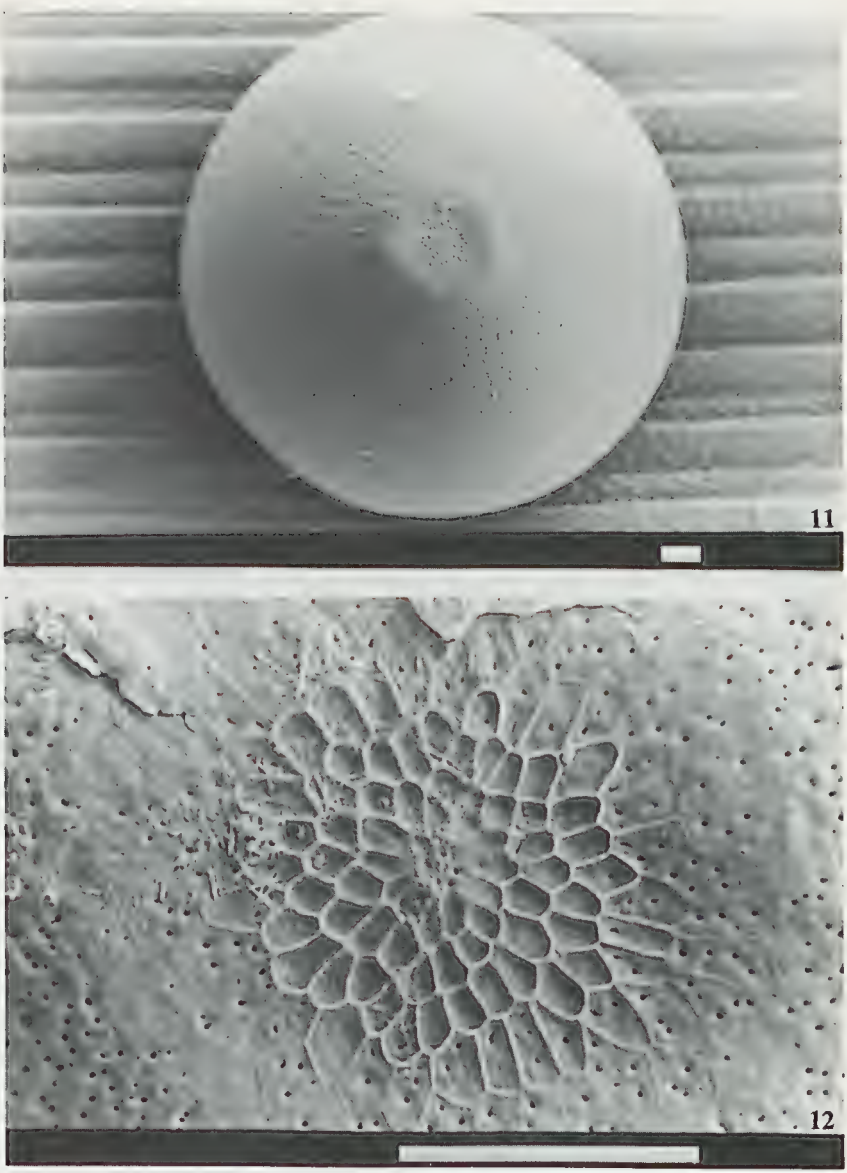
Observations over several years at Wanneroo indicate that female *M. cyanophracta* prefer to oviposit on young vigorously growing foodplants. They will often favour sites which have recently regenerated after fire, or select young *P. occidentalis* plants growing alongside tracks or firebreaks. Similar behaviour has been recorded for *Trapezites sciron sciron* Waterhouse & Lyell near Perth, where ovipositing females showed a distinct preference




**Figs 1-8.** Juvenile and adults of *Mesodina cyanophracta* Lower from Wanneroo, W.A. (1) egg; (2) 1st instar larva; (3) final instar larva; (4) final instar larval head; (5) frons of pupa and operculum; (6) pupa; (7) adult male, upperside and underside; (8) adult female, upperside and underside. Scale bars: (1, 2) = 1 mm, (3-6) = 5 mm, (7, 8) = 10 mm.




**Figs 9-10.** Scanning electron micrographs (SEM) of egg of *Mesodina cyanophracta* Lower from Wanneroo, W.A. (9) showing delicate lace-like ribbed structure, (10) detail of micropyle pattern. Scale bar = 100 m.




**Figs 11-12.** Scanning electron micrographs (SEM) of egg of *Mesodina halyzia* (Hewitson) from Catherine Hill Bay, N.S.W. (11) showing delicate lace-like ribbed structure, (12) detail of micropyle pattern. Scale bar = 100 m.

for young vigorously growing *Lomandra caespitosa* (Benth.) foodplants (Williams *et al.* 1992). Larvae of *M. cyanophracta* are frequently attacked by a slender endoparasitic wasp, *Casinaria* sp. nr. *meridionalis* (Turner) (Ichneumonidae), that eventually kills them in the final instar (AFA identification - see Gauld 1984).

Voucher specimens pertinent to this paper are lodged in the Insect Collection of the Western Australian Department of Conservation and Land Management and in Andrew Atkins' private collection.

**Acknowledgment**

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